



**UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
097160,657	09/29/98	LYDING	22010-135/IL

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MM21/1229

EXAMINER
GUERRERO, M

ART UNIT	PAPER NUMBER
2822	

DATE MAILED: 12/29/98

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/160,657

Applicant(s)
Lyding et al.

Examiner
Maria Guerrero

Group Art Unit
2822



☒ Responsive to communication(s) filed on Sep 25, 1998

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 15-27 and 36-39 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 15-27 and 36-39 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☒ The drawing(s) filed on Sep 25, 1998 is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Drawings

1. New formal drawings are required in this application because the drawings filed on September 25, 1998 are objected by the Draftsperson. Applicant is advised to employ the services of a competent patent draftsperson outside the Office, as the Patent and Trademark Office no longer prepares new drawings.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 15-20, 23-25, 27 and 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamazaki (U.S. 4,239,554).

Yamazaki discloses a semiconductor device being passivated with deuterium (inherent) (col. 3, lines 40-45), the devices comprises semiconductor containing one or more elements from Group III, Group IV, or V of the periodic table (col. 2, lines 60-68, col. 3, lines 48-65), the semiconductor comprises silicon, the devices comprises a semiconductor layer 4, an insulating

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layer 6 (silicon oxide or silicon nitride) (col. 4, lines 20-25), a conductive layer 5 comprises a metal such as titanium, aluminum, nickel, or the like (see col. 4, lines 15-20), it is also disclosing an encapsulation film 7 (inherent) (see col. 4, lines 23-25).

4. Claims 15-17 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Van Den Beemt (U.S. 4,542,512).

5. Van Den Beemt discloses a semiconductor device being passivated, it is disclosing a substrate being gallium arsenide (see col. 5, lines 10-20), deuterium ions may be implanted (see figs. 5 and 6, col. 5, lines 50-55, col. 6, lines 43-45).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 15-27, and 36-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Levinstein et al. (U.S. 4,151,007) in view of Brown et al. (U.S. 4,962,065).

Levinstein et al. discloses a metal-oxide semiconductor field effect transistor structure comprising, a substrate 12 (silicon) an insulating layer 18 (silicon oxide), a gate electrode 20 (polycrystalline silicon), a silicon oxide layer 22, metallic layers 24, 26 and 28 (aluminum), the

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structure being passivated with hydrogen by an annealing step (see fig, Abstract, col. 1, lines 5-15, col. 2, lines 15-40, col. 3, lines 1-45)..

Brown et al. discloses than the used of deuterium followed by annealing has been known to minimize displacement damage (col. 10, lines 30-35).

It would have been obvious to a person of ordinary skill in the art to modify Levinstein et al. 's device by passivated the semiconductor device with deuterium as taught by Brown et al. **because** the used of deuterium or hydrogen for passivation is conventional in the art.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Shufflebotham (U.S. 5,711,998) discloses a device being passivated with deuterium.
9. Nickel (U.S. 5,744,202) discloses an encapsulated semiconductor device being passivated.
10. Warren et al. (U.S. 5,830,575) discloses a MOS devices being passivated with deuterium (see figs. 1A-2A, 6A-7, col. 4, lines 15-20,63-67, col. 5, lines 30-35).
11. Holbrook et al. (U.S. 4,352,835) discloses a device bombardment with deuterium.
12. Mircea et al. (U.S. 4,936,781) discloses a device comprising a layer of Group III-Group V material and being neutralized with atomic hydrogen.
13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Guerrero whose telephone number is (703) 305-0162. The examiner can normally be reached on Monday-Friday from 8:00 A.m. to 4:30 P.m..

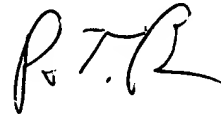
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Brown, can be reached on (703) 308-4083. The fax phone number for this Group is (703) 308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-4900.

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December 18, 1998



Peter Toby Brown
Supervisory Patent Examiner
Technology Center 2800